Marine Environment SEMO4012

Course Presentation





Co-funded by the Erasmus+ Programme of the European Union





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1.0 Introduction to course

This course is an elective course with 2 credits (3 ECTS), offered specifically to Bachelor of Engineering (Naval Architecture and Offshore Engineering) students; and was developed by Faculty of Mechanical Engineering, Universiti Teknologi Malaysia.

This course introduces the knowledge of marine meteorology and oceanography. It explains the fluid physical characteristics and movement on the earth's surface. As such, the students will have clear understanding of the weather that results from interaction between the atmosphere and the sea surface. Following this, the students will gain a better appreciation of between the the interactions marine environment and marine vehicles/structures. As such, the important issue relating to marine safety, sustainability, and environmental impact (Climate Change and Sea level Rise) can be addressed.

By the end of the course, students will success to:

- 1. Students will be able to Describe the Marine Meteorology and Oceanography phenomena and their characteristicsStudents will be able to analyse the effects marine of marine environment on vessels and offshore structures.
- 2. Students will be able to Analyse the relationships between the marine environment and marine vehicles/structures
- 3. Students will be able to Apply relevant knowledge to carry out/propose sustainable environmental projects.

2.1 Course Planning

WEEK	ΤΟΡΙϹ
WEEK 1	Origins of atmosphere and ocean basins Fluids: Atmosphere and water
WEEK 2	Hydrological Cycle: Water in the atmosphere. Energy source and heat distribution
WEEK 3	Vertical stability and temperature distribution
WEEK 4	Cloud, precipitation and visibility
WEEK 5	Pressure gradients and atmosphere
WEEK 6	Climatology General circulation of the atmosphere. Global distribution of pressure. Air and sea surface temperatures. Winds and precipitation over the oceans. Local circulations. Land and sea breezes.
WEEK 7	Weather Systems Air masses. Extra-tropical cyclones, anti-cyclones and associated weather. Fronts and their movements. Sequences of clouds and weathers at fronts. Intertropical convergence zones. Tropical revolving storms, assoc weather, winds and clouds.
WEEK 8	Mid-Semester Break
WEEK 9	Constituents of sea water Water masses
WEEK 10	Waves and tides
WEEK 11	Oceanic circulation
WEEK 12	Marine renewable energy devices
WEEK 13	Marine pollution

2.2 Teaching Method

Details on Innovative T&L practices:

No.	Туре	Implementation						
1.	Active learning	Conducted through in-class activities						
2.	Case-based learning	Conducted through project assignments. Students are given current						
		environmental issues and are required to analyse and give recommendation on						
		the issue by project report and presentation.						

Distribution	Teaching and Learning Activities			arning Activities			
of student							TOTAL
Learning							SLT
Time (SLT) Course	Guided Learning		Guided Learning	Independent Learning			
content	(Face to Face)		Non-Face to Face	Non-Face to face			
outline			(Assessment and preparation)	(Revision)			
CLO	L	Т	Р	0			
CLO 1	15h				4h	2h	21h
CLO 2	14h				4h	2h	20h
CLO 3	1h				4h	4h	9h
Total SLT	30h				12h	8h	50h

	Continuous Assessment	PLO to be assessed	Percentage	Total SLT
1	Assignment and Quiz	Knowledge, Thinking Skill	40	16
2	Project	Digital Skill, Teamwork	20	12h
3	Test	Knowledge	40	2h
		Total	Grand Total	80h

2.3 Learning Material

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fnt Site home	Week 2 - Hydrological Cycle: Water in the Atmosphere. Energy Source and Heat	Chap 5 - Wind 25/6/2021 7:35 AM Microsoft PowerP Chap 5a - Climatology 23/8/2020 6:37 PM Microsoft Edge P
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		GTS network 28/6/2021 10:07 AM JPG File Meteological zones 28/6/2021 9:39 AM JPG File
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	SEMO4012-01 Marine Environment	Week 2 - Hydrological Cycle: Water in the
	(Environmen Marin)	Atmosphere. Energy Source and Heat
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	 Atmosphere and Ocean Basins Fluids: 	Week 3 - Pressure Gradients and
D Private files	Atmosphere and Water	Associated Winds
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	S Atmosphere	Week 4 - Climatology
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Lecture information will be uploaded in e-Learning Platform

2.3 Learning Material



Lecture information will be uploaded in e-Learning Platform

2.3 Learning Material

AUTHOR'S BIOGRAPHY

Prof. Dr. Adi Maimun is currently serving as Professor of Naval Architecture at the Department of Aeronautics, Automotive, and Ocean Engineering, Faculty of Mechanical Engineering. He specialises mainly in the field of Marine Vehicles/Structures Dynamics using CFD, AIS, time domain simulations and experimental work. He had taught, conducted research and done consulting work in the said field and had published over 70 papers in conferences and journals.

Prof. Dr. Adi Maimun is currently a Fellow Member of the Royal Institution of Naval Architects (UK) and a Chartered Engineer (UK). He had served as a committee member for a number of years for the Malaysia Joint Branch (MJB) of the Royal Institution of Naval Architects (RINA) and the Institute of Marine Engineers Science and Technology (IMarEST). He is currently the Chairman (2021-2022) for RINA-IMarEST MJB (Southern Chapter) and Chairman (since 2019) for the Ship & Marine Technical Committee, Department of Standards Malaysia.

Lecture information will be uploaded in e-Learning Platform

2.4 Course Reference

1. Meteorology for Mariners, Met. O. 895, HMSO, 1983. London.

2. Marine Observer's Handbook, Met. O. 887, HMSO, 1987, London.

3. A Course In Elementary Meteorology, Met. O. 707, HMSO, London, 1962

4. Atmosphere And Ocean : Our Fluid Environments, J.G. Harvey, The Artemis Press, 1976

5. Geography Workbook 2 – The Weather, P.Harvey, K.R. Maxted, M.G. Webb Lewis Reprints, 1978

6. Mariner's Weather Handbook – First Edition, Steve & Linda Dashew, Beowulf Inc., 1999.

7. Ocean Circulation – 2nd Edition, Joan Brown, Butterworth-Heinemann, Open University, 10th August 2001.

8. Marine Pollution Control: Legal and Managerial Frameworks, Iliana Christodoulou-Varotsi, Taylor & Francis, 24 Apr 2018.

9. Marine Pollution, Chris Frid and Bryony A. Caswell, Oxford, United Kingdom, Oxford University Press, 2017.

3.0 Course Assessment

3.1 Assignment/ Project

Νο	Learning Outcomes	Assessment Activity	
1	Ability to conceptualize on marine environment and renewable energy knowledge <u>Analyse</u> the relationships between the marine environment and marine	Assignment: -Reading and discussion of assigned papers for seminars and preparation for lectures -Preparation of short essay -Short Quiz	
	vehicles/structures		
2	Analyse the relationships between the marine environment and marine vehicles/structures Apply relevant knowledge to carry out/propose sustainable environmental projects.	Project based learning -CFD Simulation -Project discussion and presentation	

- Universiti Teknologi Malaysia (UTM) is committed to academic integrity.
 Plagiarism, collusion, and cheating are strictly prohibited.
- Student is expected to submit work and present as your own without copy text or material from other sources.
- PLAGARISM DETECTION SOFTWARE (Turnitin) will be used to test the similarity from online sources.

3.0 Course Assessment

3.1 Assignment

₽ TC	PIC 2: OCEANIC ATMOSPHERE 🖉
2.1 Ori	igins of the Atmosphere and Ocean Basins
2.2 At	mospheric Measurement
2.3 At	mospheric pressure and wind
2.4 W	aves and tides
2.5 O	ceanic Circulation
÷	
	Mark as aone
	Dear students,
	kingly download the lecture notes here and watch the related videos for each lesson.
+	ELESSON 1 🖉
	Mark as done
	Watch the following video to learn about atmosphere and water.
.† .	
	Mark as done
	please watch the video to learn about relationship between atmospheric pressure and wind.
+	
	Mark as done
	PREPARE ONE SHORT ESSAY WITHIN 250 WORDS.

3.0 Course Assessment

3.1 Project

The students will be divided into groups of 4-5 students and choose 1 topic among 6 topics including hydropower, biomass energy, waste to energy, solar energy, wind energy and energy efficiency.

Students will complete the group project report according to the specific requirements of each topic.

ITEM	MARKS	Course work mark (%)
INTRODUCTION	15	3
LITERATURE REVIEW	4	2
METHODS AND SET UP	14	7
RESULT	8	4
ANALYSIS & CONCLUSION	4	2
INDIVIDUAL QUESTION	10	5
MINUTE OF MEETING 260622	2	2
MINUTE OF MEETING OVERALL	1	1
PEER EVALUATION	2	2
TOTAL MARKS		28

4.0 Course Evaluation

4.1 Questionnaire for Students

COURSE EVALUATION

SEMO4012 Marine Environment

Google Form: <u>https://forms.gle/CYoka8euej24N2RC7</u>